National Cooperative Dairy Herd Improvement Program
RECORD BOOK
A plan for every size herd
STANDARD DHIA OWNER SAMPLER WEIGH-A-DAY-A-MONTH
AGRICULTURAL RESEARCH SERVICE, U. S. DEPARTMENT OF AGRICULTURE

ARS-44-131
Dairy-Herd-Improvement Letter (Vol. 39, No. 5)

July-August 1963

SIRE EVALUATION PLANS FOR 1963-1964

Sire Summaries

Four sire summaries will be provided each on a within-breed basis. This will result in quarterly summaries for young or new sires, all active AI sires, and special requests. On a semiannual basis, previous evaluations will be updated provided there is a 50 percent or greater increase in number of progeny. These evaluations are scheduled as follows:

A. July

1. New sires having five or more progeny.
2. Active AI sires.
3. Special requests.
4. Sires having 50 percent or more increase in number of progeny during the past six months.

B. October

1. New sires having five or more progeny.
2. Active AI sires.
3. Special requests.

C. January

(Same as July)

D. April

(Same as October)

Issued August 1963

Distribution of Individual Sire Records and Sire Summaries

As in the past, two copies of the Individual Sire Record will be sent to the extension dairyman in charge of testing in each State from which a sire's progeny are represented. One copy will be sent to the appropriate breed association and at a later date one copy will be sent to the appropriate AI organization.

Considerable effort is required in editing, reproducing, printing, binding, and distributing DHIA Sire Summaries. The two summaries produced in 1962-1963 and distributed to a mailing list of approximately 7,000 involved 9,592,500 pages. Such efforts are both time-consuming and costly and will increase as a result of the quarterly evaluations now scheduled. Consequently, it will be necessary to reduce considerably the number of copies of the DHIA Sire Summary produced. Plans are to provide a copy to each extension dairyman, three to each department (Dairy or Animal), five to each AI organization and five to each breed association. A limited number of additional copies will be available for others who need them.

Cow Index

During the past year all registered progeny of AI sires were evaluated and their performance in milk yield expressed as a weighted difference from their adjusted herdmate average. Those daughters whose weighted differences were in excess of 1.5 standard deviations were listed on the appropriate sire's summary report.

Plans are now being made to provide a cow index in order to recognize the outstanding registered progeny of superior AI sires and to assist in making selective matings. This method of evaluation will include the cow's average deviation from her adjusted herdmate average, the average deviation of other daughters of the sire from their adjusted herdmate average, and appropriate adjustments for number of cow's records and number of paternal half sisters.

Cows will be indexed on the basis of milk yield. The frequency of cow evaluations, forms on which summaries are to be reported, and distribution of results will be discussed at a later date.

Identifying Evaluated Sires by Name

Considerable effort and time are involved in identifying evaluated bulls by name. This is primarily why only about 20 percent of the sires summarized in April, 1963, were identified by name, date of birth, and dam number. Briefly, the procedure involved is as follows.

After each summary, listings are made of those summarized sires having missing names. In the case of Holsteins, the needed information is taken directly from Herd Books. For other breeds, it is necessary to send the listings to the appropriate breed associations. As the names, birth dates and dam numbers of these bulls become available they are added to a pedigree-tape-file which is used in future sire evaluations. Efforts are being made to identify a higher percentage of sires by name. However, presently employed procedures will not permit providing names of bulls in their initial summary.

MEANING AND USE OF "PREDICTED AVERAGE" RATING OF AI SIRES

The "Predicted Average" rating computed and published for sires with progeny resulting from artificial insemination (AI) is a slight modification of the simple daughter-herdmate difference, as pointed out in the April 1962 Newsletter. Natural-service sires are evaluated solely on the simple difference,

Daughters' Average - Adjusted Herdmate Average.

Research indicates that additional accuracy is achieved by adjusting each AI sire's rating for average differences among AI herds in genetic merit. This is done by adjusting the simple daughter-herdmate difference as follows:

Adjusted Difference =

Daughters' Av. - Adj. Herdmate Av. +

0.1 (Adj. Herdmate Ave. - Breed Ave.).

If an average value is desired, the Adjusted Daughter Average can be obtained by adding the Adjusted Difference to the Breed Average.

Finally, since the accuracy of a bull's evaluation increases as the number of his AI progeny increases, the

Adjusted Difference can be corrected to account for variations in its reliability as follows:

$$\text{Predicted Average} = \text{Breed Av.} + \frac{\text{No. Daus.}}{\text{No. Daus.} + 12} \text{ (Adjusted Difference)}$$

This gives the final estimate of the breeding merit of an AI bull. With daughters scattered in many different herds, the reliability of this rating can approach maximum accuracy with a very large number of progeny. In contrast, where each bull's daughters are largely in a single herd, the accuracy of comparing sires is neither great nor materially enhanced by including more than 30 unselected progeny.

The "Predicted Average" rating is an estimate of the average performance of many future daughters sired by the bull, where these progeny are unselected and scattered throughout all different types of herd-environmental conditions. The level is based upon nationwide DHIA conditions as a whole.

The primary purpose of the "Predicted Average" evaluation is to compare or rank AI bulls as to estimated breeding value. It is the most reliable method currently available for this purpose. It is applicable to individual dairymen in their choice of AI sires since a given number of bulls will rank similarly in breeding value both within and throughout a large number of herds.

RECOGNITION AND USE OF GENETICALLY SUPERIOR BULLS BY DAIRYMEN

It is estimated that upwards of 25,000 sires will be summarized in the USDA Sire Evaluation Program this year while approximately 2,200 dairy bulls will be active in AI, most of which will have a sufficient number of production tested progeny to permit analysis on a quarterly basis. Genetic differences exist between AI bulls in their breeding value for milk yield. These differences can be seen, in a general way, from the following summary of 976 Holstein

AI sires evaluated in December, 1962:

No. sires	No. daus. with Herdmates	Predicted milk yield of AI sires Av. (lbs.)	Range (lbs.)
8	2,497	13,670	13,500-14,499
231	54,938	12,793	12,500-13,499
664	102,062	12,043	11,500-12,499
72	8,317	11,285	10,500-11,499
1	22	10,432	9,500-10,499

It can be seen that the top 24-1/2 percent of the bulls exceeded the bottom 7-1/2 percent in "Predicted Average" by 1,550 pounds of milk while the top eight bulls were superior to the average of all bulls by 1,494 pounds of milk.

As the results of the quarterly USDA sire evaluations become available, it will be possible to recognize the genetic worth of the nation's bulls more effectively than in the past. This further development now points to the important challenge of keeping dairymen abreast of the results of these uniformly derived sire evaluations, and especially for the bulls which are available to them.

The gap between the results of the USDA Sire Evaluation Program and their use by individual dairymen is a difficult one to surmount. A total of 41,937 herds are enrolled in Standard DHIA and 68,813 in the combined recordkeeping plans provided by DHIA. Of yet greater expanse is the nation's herd of some 19,215,000 dairy cows and heifers two years of age or older which are located in an estimated 1,105,000 herds. Assuredly it is beyond reason to consider the distribution of USDA sire evaluation results directly to such a large number of dairymen. However, such information could be made more useful when further distributed by way of the many excellent "DHIA (or) Dairy Letters" now provided by extension dairymen and by existing means of communication from county agricultural agents to individual dairymen. Sire evaluation results, representing active AI bulls in the respective areas, could be taken directly from either the DHIA Sire Summary List or more expediently from the Individual Sire Reports.

If this were possible, dairymen would benefit further by having sire evaluation results representing bulls available to them which were uniformly derived from all available Standard DHIA and DHIR production records, and reasonably current. It should encourage more dairymen to place major

emphasis on the breeding value of bulls for production rather than solely on such traits as coat color, conformation and conception rate. It is even possible that it would stimulate some of the many dairymen who have exercised little or no choice in the use of AI bulls in the past to do so based on sound evidence.

DEADLINES FOR SUBMITTING RECORDS TO DAIRY HERD IMPROVEMENT SECTION

Deadline Dates for Lactation Records

Magnetic Tapes			1095
Approximate date of run	Centers which have been submitting tapes	Initial use of tape	
Oct. 1	Sept. 15	Sept. 1	Sept. 1
Jan. 1	Dec. 15	Dec. 1	Dec. 1
April 1	March 15	March 1	March 1
July 1	June 15	June 1	June 1

No deadlines are set on 718's; however the States are urged to submit these to the Section as they are completed so that the work of punching and verifying might be spread more evenly over the year. All 718's that are ready at the beginning of any run will be used in that run.

Herd records should be sent to the Section as soon as they are completed. All records should be sent by June 1 of each year for inclusion in the July run. In particular, the States are urged to send in the 780's as they are completed so that the work of punching and verifying these might also be spread more evenly over the year.

UNITED STATES DEPARTMENT OF AGRICULTURE

WASHINGTON 25, D. C.

Official Business

POSTAGE AND FEES PAID
U. S. DEPARTMENT OF AGRICULTURE